

New Subspecies of *Leionema lamprophyllum* (F. Muell.) Paul G. Wilson (Rutaceae).

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Abstract

A morphological study of *Leionema lamprophyllum* (F.Muell.) Paul G. Wilson has identified three entities here recognised as subspecies: *Leionema lamprophyllum* subsp. *lamprophyllum*, which is endemic to subalpine regions of Victoria; *L. lamprophyllum* subsp. *orbiculare* F.M. Anderson subsp. nov.; which is endemic to New South Wales; and *L. lamprophyllum* subsp. *obovatum* F.M. Anderson subsp. nov.; which is found in the Australian Capital Territory, New South Wales and Victoria. Their distributions, habitats, and conservation status are discussed. A key to the subspecies of *L. lamprophyllum* is provided.

Introduction

Wilson (1970) noted morphological variation in *Phebalium lamprophyllum* (F.Muell.) Benth. 'as a topocline' from Rylstone, New South Wales, in the north to Victoria in the south. This species was transferred to the new genus *Leionema* by Wilson (1998). Field observation and inspection of herbarium specimens held at CANB, MEL, NE, and NSW indicate that *L. lamprophyllum* is a polymorphic species containing three distinct entities of distinct morphology and distribution. These entities are here formally described as subspecies.

Taxonomy

Leionema lamprophyllum (F. Muell.) Paul G. Wilson. *Nutysia* 12(2): 267–288. *Eriostemon lamprophyllus* F. Muell., *Quart. J. Pharm. Soc. Victoria* 2: 43 (1859). Type: mountains on the Macalister River, Victoria, January 1859, F. Mueller (lectotype, here designated MEL 4784; isoelectotypes AD n.v., K n.v., MEL 4318, MEL 4785, NSW n.v.). *Phebalium lamprophyllum* (F. Muell.) Benth., *Fl. Austral.* 1: 340 (1863).

Compact shrub to 2 m high. *Branchlets* terete or angular when immature, sparsely to densely glandular-verrucose, pilosulous to pilose with simple and 2–8-rayed stellate hairs in longitudinal lines between glabrous leaf-decurrencies or, in subspecies *orbiculare*, with stellate hairs all round the branchlets. *Leaves* alternate. *Petiole* 0.3–1.2 mm long, glabrous or sometimes pilosulous with stellate hairs. *Lamina* subcoriaceous, elliptic to broadly obovate to orbicular, (1.7–)2.4–10.6(–14.2) mm long, (1.3–)2.2–4.3(–5.4) mm wide, usually glabrous but sometimes pilosulous with simple or stellate hairs along the margin and/or midrib; leaf base attenuate to obtuse, margin often flushed pink, plane to slightly recurved when dry, entire to minutely crenate or crenate at apex, apex acute to obtuse or, in subspecies *orbiculare*, minutely mucronate, apex sometimes crowned with a cluster of simple hairs; adaxial surface glossy, appearing smooth to the naked eye but covered in minute tubercles, prominently glandular-punctate, glands generally become sunken when dry and lamina wrinkled due to contraction of mesophyll tissue between glands, midrib flat or slightly impressed lateral nerves not visible; abaxial surface paler than adaxial surface. *Inflorescences* terminal or in upper axils of umbellate cymes, rarely flowers terminal and solitary. *Pedicel* slender to somewhat expanded and fleshy at apex, 1.0–6.0 mm long, with a sparse minute stellate indumentum. *Prophylls* elliptic, 0.3–2.5 mm long, one subtending each pedicel, leaf-like, concavo-convex, glabrous or with a few

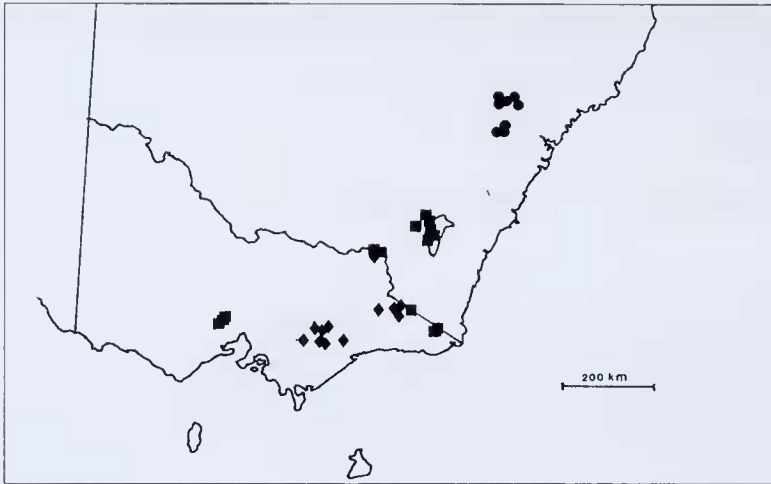


Fig. 1. Distribution of *Leionema lamprophyllum*: ▲ = subsp. *lamprophyllum*; ■ = subsp. *obovatum*; ● = subsp. *orbicularis*.

simple to minutely stellate hairs. *Metaxyphylls* minute, 0.2–0.6 mm long, 2 occurring in lower half of pedicel, concavo-convex with a few minute simple hairs on outer surface, margin ciliate. *Flower bud*, obovoid, white to pink. *Sepals* deltoid, concavo-convex, 0.3–0.6 mm long, fleshy, glandular-punctate, margin ciliate. *Petals* narrow-elliptic, 2.0–4.4 mm long, white with tips often flushed pink on abaxial surface, caducous, glandular-punctate on abaxial surface, glabrous, apex inflexed, midrib prominent. *Stamens* equal to or slightly exceeding petals, filaments slender, terete to slightly flattened, tapering distally, 2.2–5.2 mm long, glabrous, anthers cordate-ovate, 0.4–0.9 mm long, dorsifixed and versatile, pale pink or yellow. *Gynophore* short-cylindrical, 0.2–0.7 mm high, red, glabrous, slightly narrower than the ovary. *Ovary* sub-spherical to \pm cylindrical, 0.5–2.0 mm high, glabrous, upper 1/3 to 1/2 sterile. *Style* terete, 1.5–3.7 mm long, glabrous, gynobasic, equal to stamens, stigma only slightly differentiated. *Fruit* a schizocarp. *Cocci* usually 2–4, spreading, 2.1–4.0 mm long, obliquely ovoid, sparsely glandular-punctate, outer edge minutely apiculate to shortly rostrate, apiculus/beak 0.4–1.7 mm long. *Seed* narrowly ovoid, 2.2–3.5 mm long, raphe basal, testa smooth and thinly crustaceous, glossy black to dark brown, aril cream-coloured; surface at magnification smooth, epidermal cells with junction of anticlinal walls sunken.

Distribution: *Leionema lamprophyllum* occurs along the Great Dividing Range of south eastern Australia, from Rylstone c. 140 km north-west of Sydney, southwards to the Brisbane Ranges c. 70 km west of Melbourne (Fig. 1).

Key to the subspecies of *Leionema lamprophyllum*

1. Leaves suborbicular to orbicular, (1.7–)2.4–3.2(–3.9) mm long, apex rounded to minutely mucronatesubsp. *orbiculare*
1. Leaves elliptic to obovate, (2.6–)4.0–10.6(–14.2) mm long, apex acute to obtus2
2. Leaves elliptic, (5.6–)7.6–10.6(–14.2) mm long; apex acute, margin entire to minutely erose toward apex; petals (3.3–)3.7–4.3(–4.4) mm long; pedicel (3.0–)3.5–5.0(–6.0) mm long.....subsp. *lamprophyllum*
2. Leaves obovate to broadly obovate, (2.6–)4.0–6.2(–9.0) mm long; apex obtuse (rarely subacute), margin entire to minutely erose or crenulate toward apex; petals (2.0–)2.4–3.7(–4.3) mm long; pedicel (1.0–)1.5–2.7(–3.8) mm longsubsp. *obovatum*

Leionema lamprophyllum (F. Muell.) Paul G. Wilson subsp. *lamprophyllum* Type indicated above under *Leionema lamprophyllum*.

Branchlets prominently glandular-verrucose, pilosulous to pilose with simple or 2–8-rayed stellate hairs in longitudinal lines between glabrous leaf-decurrencies. *Petiole* mostly 0.5–1.2 mm long. *Lamina* elliptic, (5.6–)7.6–10.6(–14.2) mm long, apex acute and usually glabrous but sometimes pilosulous, margin entire to minutely crose toward apex, leaf base attenuate. *Peduncle* (2.8–)3.3–5.3(–6.0) mm long. *Pedicel* (3.0–)3.5–5.0(–6.0) mm long. *Prophylls* mostly 0.5–2.5 mm long. *Metaxyphylls* 0.2–0.4 mm long. *Sepals* mostly 0.3–0.6 mm long. *Petals* (3.3–)3.7–4.2(–4.4) mm long. *Stamens* (3.2–)3.7–4.3(–4.7) mm long; anthers mostly 0.6–0.9 mm long. *Gynophore* mostly 0.4–0.7 mm long. *Ovary* (1.1–)1.2–1.8(–2.0) mm long. *Style* gynobasic, (1.9–)2.0–2.4(–2.7)

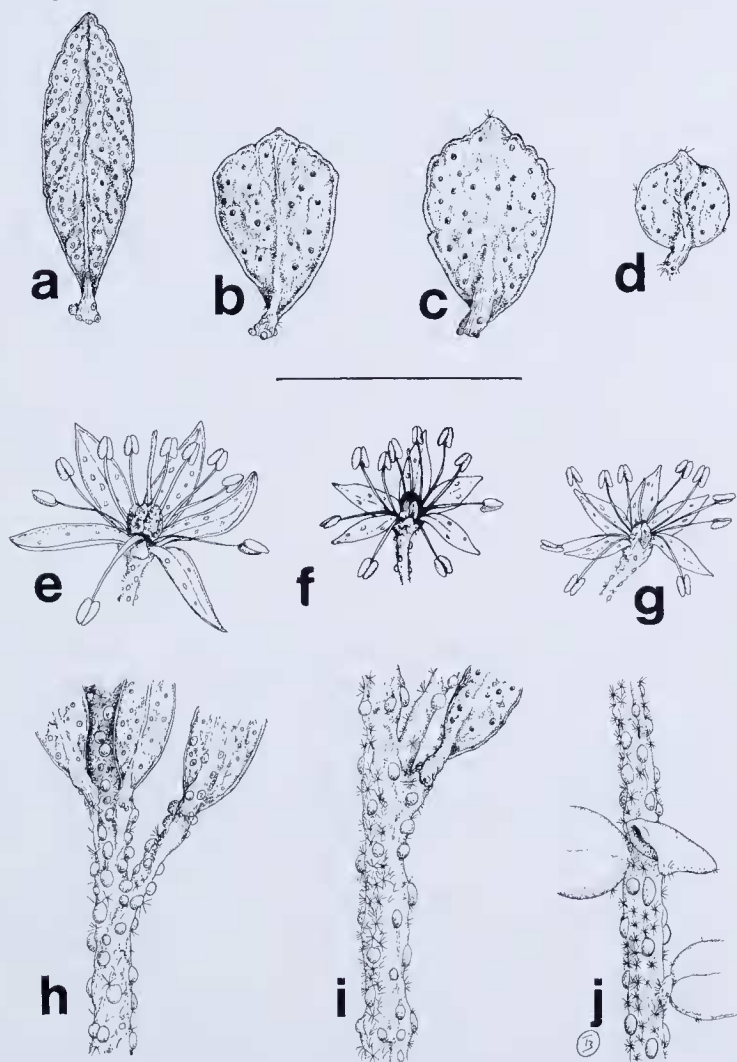


Fig. 2. *Leionema lamprophyllum*; **a–d** leaves $\times 5$; **a** subsp. *lamprophyllum*; **b**, **c** subsp. *obovatum*, **d** subsp. *obovatum*; **e–g** flowers $\times 5$; **e** subsp. *lamprophyllum*, **f** subsp. *obovatum*, **g** subsp. *obovatum*; **h–j** stem detail $\times 5$; **h** subsp. *lamprophyllum*, **i** subsp. *obovatum*, **j** subsp. *obovatum* (**a**, **d**, **h** from Willis s.n. MEL; **b**, **f**, **i** from L.D. Pryor s.n., NE; **c** from N.A. Wakefield 318, MEL; **d**, **g**, **j** from P.M. Althofer, NE).

mm long. *Cocci* minutely apiculate to shortly rostrate, mostly 3–4 mm long; beak/apiculus mostly 0.6–1.7 mm long. *Seed* mostly 2.5–3.6 mm long. (Fig. 2a, e, h)

Representative Specimens (27 specimens examined): VICTORIA: Little River Gorge Lookout, 5.i.1970, A.C. Beanglehole 33156 & E.W. Finck (MEL); Ballantyne Hills, 17.i.1970, A.C. Beanglehole 33386, K.C. Rogers & E.W. Finck (NSW); Reedy River Gorge, Nunniong Plateau, 13.xi.1964, J. H. Willis (MEL); Macalister River, F. Mueller s.n. (MEL); Wellington River, c 8 km due N of Licola, 30.xii.1998, F.M. Anderson 7–10 & N.G. Walsh (MEL); Mount Ray c. 45 km NNE of Sale, 30.xii.98 F.M. Anderson 3–6 & N.G. Walsh (MEL); near summit of Mount Hedrick, Spring 1992, J. Hoey s.n. (MEL).

Distribution and Conservation Status: *Leionema lamprophyllum* subsp. *lamprophyllum* is apparently endemic to Victoria, occurring in the Eastern Highlands and East Gippsland natural regions of Conn (1993) on and south of the Great Dividing Ranges, from near Erica eastwards to Mt Tingaringy on the New South Wales border, with concentrations in the Licola and Suggan Buggan areas (Fig.1). This subspecies may possibly occur in Kosciuszko National Park which is close to known populations at Mount Tingaringy. Further searches of likely habitat are required to confirm this possibility. The Risk Code (*sensu* Briggs and Leigh 1995) for *L. lamprophyllum* subsp. *lamprophyllum* is assessed at 3RC- P3 with populations reserved in Baw Baw National Park, Avon Wilderness Park, and the Alpine National Park.

Habitat: Subspecies *lamprophyllum* is recorded to occur on rocky and exposed escarpments, often with a NE to NW aspect, and skeletal soils derived from sedimentary rocks (e.g. mudstone, sandstone) or in shallow gravelly soils derived from conglomerate and rhodacite parent material. It is usually a component of subalpine (shrubland or *Eucalyptus*-dominated woodland) communities. Flowering: Winter-Spring; fruiting: Spring-Summer.

Notes: A population at Mt Ray (c. 45 km NNE of Sale) contains plants with leaves at the lower limit of the length:width ratio, some of which, on this attribute alone might key to subsp. *obovatum*. Field examination of the population showed that these extremes were from plants growing in heavily shaded sites. All other specimens collected at this site agree with the typical form.

***Leionema lamprophyllum* subsp. *orbiculare* F.M. Anderson subsp. nov.**

A subspecies typica foliis minoribus orbicularibus, basi obtusa, apice mucronata minute differt.

Type: New South Wales, Currant Mountain Gap, ca. 24 km east of Rylstone, 10.viii.1975, R. Coveny 6609 & P. Hind. (holotype NSW 469920; isotypes A n.v., CANB 249985, K n.v., L n.v., LE n.v., MO n.v., P n.v., PERTH n.v., PRE n.v., RSA n.v.)

Branchlets sparsely glandular-verrucose with 2–8- rayed stellate hairs all around the branchlets. *Petiole* mostly 0.3–1.0 mm long. *Lamina* suborbicular to orbicular, (1.7)–2.4–3.2(–3.9) mm long, apex rounded to minutely mucronate and often pilosulous, otherwise glabrous, margin entire, plane to recurved when dry, leaf base obtuse. *Peduncle* (1.0–)1.7–3.3(–4.5) mm long. *Pedicel* (1.1–)1.7–3.2(–4.9) mm long. *Prophylls* (0.3–)1.2–1.8(–2.3) mm long. *Metaxyphylls* minute, mostly 0.3–0.5 mm long. *Petals* (2.3–)2.8–3.2(–3.7) mm long. *Stamens* (2.5–)3.2–3.8(–4.4) mm long; anthers mostly 0.5–0.8 mm long. *Gynophore* mostly 0.3–0.5 mm long. *Ovary* (0.6–)0.8–1.0(–1.3) mm long. *Style* (2.1–)2.6–3.5(–3.6) mm long. *Cocci* minutely apiculate, mostly 2.1–3.1 mm long; apiculus 0.4–0.6 mm long. (Fig. 2d, g, j)

Representative Specimens (34 specimens examined): NEW SOUTH WALES: Kyber Pass c. 37 km east of Rylstone, 4.x.1969, J.H. Willis s.n. (MEL); Head of Coricudgy Creek, 30.viii.1957, L.A.S. Johnson s.n. (MEL); East side of Lithgow Water Supply, 21.x.1939, M. Blakely s.n. & J & W. Buckingham (NSW); Carne Creek Cliffs, Newnes State Forest, 22.ix.1987, P. Hind 5330 & G. D'Aubert (NSW); Hills east of Rylstone, vi.1950, S. Smith-White & H.S. McKee s.n. (NE); "Kyber" Currant Mountain Gap, ix. 1951, P.M. Althofer s.n. (NSW); Kandos Weir Picnic Area, 29.ix.1979, A.D. Chapman 1469 (CANB, NSW).

Distribution and Conservation Status: *Leionema lamprophyllum* subsp. *orbiculare* is known from three localities in the Central Tablelands and Central Western Slopes of New South Wales, occurring along the Great Dividing Range in a linear band from Rylstone to Lithgow (Fig. 1). The region directly east of Rylstone includes Olinda, Kandos Wier, Mount Coricudgy, and Currant Mountain Gap (also known as the "Kyber Pass"). Collections from the Lithgow area come from Morts Gully, Lithgow Water Supply-Clarence and to the north in Newnes State Forest.

Subspecies *orbiculare* has a very restricted distribution with a range of less than 100 km, and employing the criteria of Briggs and Leigh (1995) has a Risk Code Risk Code 2R- P3. This subspecies is known mainly from collections within State Forests (e.g. Newnes, Coricudgy), Wollemi National Park (south side of Dunns Swamp) and around Currant Mountain Gap which is not in a reserve.

Habitat: This subspecies is apparently confined to exposed rocky sites often with a NE to NW aspect on sandy loams and skeletal soils derived from Triassic Narrabeen Sandstone. In this heavily dissected sandstone country the parent material is often exposed forming ridges, ledges, turrets or domes. There have also been a few collections taken at sites where the subspecies was growing in cracks through conglomerate defiles.

This subspecies has been recorded by collectors as occurring in a variety of vegetation types from open heath to open shrubland consisting of *Acacia* and *Calytrix* species to low open *Eucalyptus*-dominated woodland. Flowering: Winter-Spring; fruiting: Spring-Summer.

Notes: *Leionema lamprophyllum* subsp. *orbiculare* closely resembles *Leionema microphyllum* but differs from that species in having a verrucose stem, short gynophore and glabrous leaves, though occasionally the leaves have simple or minute stellate hairs on the abaxial (rarely the adaxial) surface on the midrib, apex and margin regions.

Leionema lamprophyllum subsp. *obovatum* F.M. Anderson subsp. nov.

A subspecies typica foliis obovatis, apice rotundato, petalis et pedicellis brevioribus plerumque differt.

Type: Australian Capital Territory, Namadgi National Park, Booroomba Rocks, 20.x.1991, A.M. Lyne 447. (holotype MEL 1612094; isotypes CANB 9106172, NSW n.v., PERTH n.v.)

Branchlets pilosulous to pilose with simple or 2–8-rayed stellate hairs in longitudinal lines between glabrous leaf-decurrencies. *Petiole* mostly 0.4–1.2 mm long. *Lamina* obovate to broadly obovate, (2.6–)4.0–6.2(–9.0) mm long, apex usually obtuse but sometimes subacute, usually glabrous but sometimes pilosulous, margin usually minutely erose or crenulate toward apex but sometimes entire, leaf base subobtusate to attenuate. *Peduncle* (0.8–)1.3–2.7(–3.6) mm long. *Pedicel* (1.0–)1.5–2.7(–3.8) mm long. *Prophylls* mostly 0.8–1.8 mm long. *Metaxyphylls* mostly 0.2–0.6 mm long. *Sepals* mostly 0.3–0.6 mm long. *Petals* (2.0–)2.4–3.7(–4.3) mm long. *Stamens* (2.2–)2.7–3.9(–5.2) mm long; anthers mostly 0.4–0.7 mm long. *Gynophore* mostly 0.2–0.5 mm long. *Style* (1.5–)2.1–3.1(–3.7) mm long. (Fig. 2b, c, f, i)

Representative Specimens (58 specimens examined): NEW SOUTH WALES: Brindabella Bridge over Goodrabbidgee River, 9.ix.1973, T. & J. Whaité 3535 (NSW); Kosciusko National Park, c. 15 km SSE of Tumut, 20.xii.1993, N. Taws 301 (CANB, NSW); Micalong Creek, c. 9 km south of Wee Jasper, 1.ix.1986, P. Ollerenshaw 1762 (CANB, NSW). AUSTRALIAN CAPITAL TERRITORY: 0.5 km from Blue Range Road, 10 km from Uriarra Road, 23.vi.1986, M.M. Richardson & P. Ollerenshaw s.n. (MEL); Upper Cotter Dam, x.1958, L.D. Pryor s.n. (CANB, NE); Cotter River, near Black Springs, 5.v.1963, R.G. Adams 622 (MEL); Tidbinbilla Reserve, 17.ix.1969, F. Ingwusen s.n. (CANB). VICTORIA: Brisbane Ranges National Park, 20.vii.1978, E.G. Errey 1447 (MEL); Spectral Track, Brisbane Ranges National Park, 15.xii.98, F.M. Anderson 1 & N.G. Walsh, (MEL); Upper Genoa River, 17.x.1948, J.H. Willis s.n. (MEL); Mid-tops of Mount Burrowa, 17.xi.1971, J.H. Willis s.n. (MEL).

Distribution and Conservation Status: *Leionema lamprophyllum* subsp. *obovatum* is known from the Tidbinbilla Range of the Southern Tablelands (due west and south-west

of Canberra) across the Brindabella Range into New South Wales and extending west to the Bogong Mountain Range. In Victoria this subspecies has a disjunct distribution, occurring to the west of Melbourne in the Brisbane Ranges and Werribee Gorge, in the far north east of the state in the Burrowa-Pine Mountain National Park, and in far east Gippsland at Upper Genoa River and Mt Tingaringy (Fig.1).

Although represented in reserves, such as Namadgi National Park and Tidbinbilla Nature Reserve in the Australian Capital Territory, Kościuszko National Park in New South Wales and the Brisbane Ranges National Park, Werribee Gorge State Park, Alpine National Park, Burrowa-Pine Mountain National Park and Coopracambra National Park in Victoria, this subspecies still is regarded as rare with a Risk Code of 3RC- P3 (Briggs & Leigh 1995).

Habitat: Populations of this subspecies in New South Wales apparently, as reported by collectors, grow on exposed sites usually with a NW to NE aspect in skeletal gravelly soils derived from granitic parent material. In the Namadgi National Park (A.C.T.) the subspecies is reported to grow in sparse to dense shrubland dominated by *Leptospermum* and *Callistemon* species. There are a few records of occurrence on exposed sandstone sites in the Upper Genoa River area in East Gippsland. The Brisbane Ranges populations occur on exposed rocky mudstone escarpments in low open woodland dominated by *Eucalyptus tricarpa*, and/or *Encalyptus macrorhyncha* woodland with shrubby understory including *Monotoca scoparia* and *Ozothamnus obovatus*. Flowering: Winter-Spring; fruiting: Spring-Summer.

Notes: The Brisbane Ranges population of this subspecies is variable in form. The leaf is usually obovate but individuals approach var. *lanceophyllum* in leaf shape and dimensions. Floral characters of these specimens however place them with subspecies *obovatum*.

Two other sites of interest are Mount Tingaringy and Burrowa-Pine National Park where it appears that both subsp. *obovatum* and *lanceophyllum* occur. The specimens from these areas are not in flower, however they agree with respective type forms based on leaf characters. Confirmation of their identity requires further collections of flowering specimens from these sites.

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